

Program Charter
For
Hydrology
Program Manager: Gary Carter
Weather and Water Goal Team Lead: George Smith

1. EXECUTIVE SUMMARY

NOAA's Hydrology Program <http://www.weather.gov/water> delivers valuable water information and predictions affecting all hydroclimatic conditions from floods to droughts. The program includes high-resolution analyses of snow pack, precipitation, and soil conditions, and the nationally consistent production of water supply estimates, river flow forecasts and flood warnings that save lives, protect property, and conserve America's water resources.

NOAA's hydrologic forecast program, within the Weather and Water Mission Goal, delivers a number of products including flood watches, river and flash flood warnings, and river and lake level forecasts through the 122 Weather Forecast Offices (WFOs) of NOAA's Local Forecasts and Warnings Program. These products reach a broad spectrum of customers including emergency and water resource managers. Emergency managers use these forecasts for both strategic, long-term planning as well as tactical, short-term planning. WFOs receive river, lake level and flash flood guidance from the 13 watershed based River Forecast Centers (RFCs) of the Hydrology Program. RFCs also provide river forecasts to water resource managers. Water resource managers make critical decisions that affect flood control, water supply, water quality, river and lake transportation, irrigation, hydropower, and recreation and maintain the ecological health of the rivers. NOAA's Office of Hydrologic Development (OHD) develops and delivers state-of-the-art science and technology used by the RFCs and WFOs. The Hydrologic Services Division (HSD) leads the customer outreach program, serves as the interagency liaison, maintains policy and requirements for and assesses the performance of the overall hydrologic services program and provides technical support for RFC and WFO hydrologic operations. Additionally, the HSD supports the National Operational Hydrologic Remote Sensing Center (NOHRSC) in its collection, assimilation, and provision of "best estimate" of snowpack characteristics for the United States.

2. PROGRAM REQUIREMENTS

A. Requirement Drivers

- 1) National Weather Service (NWS) Organic Act, 15 U.S.C. § 313 (U.S. Code as of 01/06/2003). - Sets forth the primary duties of the National Weather Service, including the requirements that the Secretary of Commerce shall: forecast the weather; issue storm warnings; display weather and flood signals for the benefit of agriculture, commerce, and navigation; gauge and report the flow of rivers; maintain and operate the seacoast telegraph lines and collect and transmit marine intelligence for the benefit of commerce and navigation; report temperature and rain-fall conditions for the cotton interests; display of frost and cold-wave signals; distribute meteorological information in the interests of agriculture and commerce; and take the meteorological observations that may be necessary to establish and record the climatic conditions of the United States, or that are essential for the proper execution of the foregoing duties.
- 2) Inland Flood Forecasting and Warning System Act of 2002, 15 U.S.C. § 313c, Pub. L. 107-253, Oct. 29, 2002, 116 Stat. 1731. Authorizes NOAA, through the United States Weather Research Program, to conduct research and development, training, and outreach activities relating to inland flood forecasting improvement, and for other purposes.
- 3) The U.S. Ocean Action Plan, December 17, 2004, calls for a national monitoring

network to observe, analyze, and forecast natural and human-induced changes that affect watershed, estuarine, and coastal ecosystems.

- 4) Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. § 1251 (U.S. Code as of 01/22/2002) *et seq.* - The principle statute governing water quality with the goal is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. The CWA regulates both the direct and indirect discharge of pollutants into the Nation's waters and prohibits the discharge into navigable waters of any pollutant by any person from a point source unless it is in compliance with a National Pollution Discharge Elimination System (NPDES) permit.
- 5) National Oceanic and Atmospheric Administration Policy on Partnerships in the Provision of Environmental Information (NOAA Partnership Policy), as amended (effective Dec. 1, 2004). - The policy responds to recommendations contained in both the National Research Council's (NRC) study, "Fair Weather: Effective Partnerships in Weather and Climate Services," (National Academy Press, 2003), and extensive public comments on a proposed policy. The NRC study identified the need for a policy that would recognize advances in technology, as well as the enactment of relevant laws and implementing guidance, particularly the Paperwork Reduction Act of 1995, 44 U.S.C. Part 45, and OMB Circular No. A-130, "Management of Federal Information Resources," 61 Fed. Reg. 6428 (February 20, 1996), which were promulgated subsequent to a previous National Weather Service (NWS) policy issued in 1991. See, 56 Fed. Reg. 1984, (January 18, 1991).

Environmental information services about weather, water, and climate are expanding to include chemical, biological, and ecological parameters. The policy uses the term "environmental information services" to capture this reality and convey the intended scope: This policy concerns provision of environmental information by all of NOAA's programs, which are organized by the NOAA strategic plan into NOAA's four mission goals.

B. Mission Requirements

- 1) Produce river flow forecasts and flood warnings that save lives, protect property in accordance with the Weather Service Organic Act (15 USC 313) and Inland Flood Forecasting and Warning System Act of 2002 (15 USC 313c).
- 2) Provide high-resolution analyses of snow pack to conserve America's water resources in accordance with the Weather Service Organic Act (15 USC 313) and Inland Flood Forecasting and Warning System Act of 2002 (15 USC 313c).
- 3) Produce precipitation, soil condition, and nationally consistent water supply estimates to save lives, protect property, and conserve America's water resources in accordance with the Weather Service Organic Act (15 USC 313) and Inland Flood Forecasting and Warning System Act of 2002 (15 USC 313c).
- 4) Develops and delivers state-of-the-art science and technology to save lives, protect property, and conserve America's water resources in accordance with the Weather Service Organic Act (15 USC 313).
- 5) Liaison and collaborate with the scientific community and other government agencies to enhance understanding of the hydrological processes in accordance with the Weather Service Organic Act (15 USC 313) and Inland Flood Forecasting and Warning System Act of 2002 (15 USC 313c).
- 6) Increase outreach to customers, and enhance customer awareness to help save lives and protect property in accordance with the Weather Service Organic Act (15 USC 313) and Inland Flood Forecasting and Warning System Act of 2002 (15 USC 313c).

3. LINKS TO THE NOAA STRATEGIC PLAN

A. Goal Outcomes

- 1) The Hydrology Program supports the Weather and Water Mission Goal Outcomes through:
 - a) Reduced loss of life, injury, and damage to the economy.
 - b) Improved decisions to support better and valuable weather and water information.
 - c) Increased customer satisfaction with weather and water information and services.

In addition, the provision of water resource forecasts supports other NOAA Strategic Plan Mission Goal outcomes as follows:

- 2) The Ecosystem Mission Goal Outcome:
 - a) Healthy and productive coastal marine ecosystems that benefit society.
- 3) The Climate Mission Goal Performance Objective:
 - a) Understand and predict the consequences of climate variability and change on marine ecosystems.
- 4) The Commerce and Transportation Performance Objective:
 - a) Reduce human risk, environmental, and economic consequences resulting from natural or human-induced emergencies.

B. Goal Performance Objectives

The Hydrology Program supports the Goal Performance Objectives through:

- 1) Increased lead time and accuracy for weather and water warnings and forecasts.
- 2) Improved predictability of the onset, duration, and impact of hazardous and severe weather and water events.
- 3) Developed application and accessibility of weather and water information as the foundation for creating and leveraging public (i.e., Federal, state, local, tribal), private and academic partnerships.
- 4) Applied and transitioned advanced science and technology to operations and services.
- 5) Increased coordination of weather and water information and services with integration of local, regional, and global observation systems.
- 6) Reduced uncertainty associated with weather and water decision tools and assessments.
- 7) Enhanced environmental literacy and improve understanding, value, and use of weather and water information and services.

C. Goal Strategies

The Hydrology Program supports the Goal Strategies by:

- 1) Improving reliability, lead-time, and effectiveness of weather and water information and services that predict changes in environmental conditions.
- 2) Integrating an information enterprise that incorporates all stages from research to delivery, seeks better coordination of employee skills and training, and engages customers.
- 3) Developing and infusing research results and new technologies more efficiently to improve products and services, streamline dissemination, and communication vital

information more effectively.

- 4) Collaborating with private industry, universities, and national and international agencies to create and leverage partnerships that foster more effective information services.
- 5) Creating a broad-based and coordinated education and outreach program by engaging individuals in continuous learning toward a greater understanding of the impacts of weather and water on their lives.
- 6) Employing scientific and emerging technological capabilities to advance decision-support services and educate stakeholders.

4. PROGRAM OUTCOME(S)

Reduce loss of life, injury, and damage to the economy, and enhanced ecosystem management through improved river, flood and water resources forecasting and delivery of water quality forecasts.

5. PROGRAM ROLES AND RESPONSIBILITIES

This program is established and managed with the procedures established in the NOAA Business Operations Manual (BOM). Responsibilities of the Program Manager are described in the BOM. Responsibilities of other major participants are summarized below:

A. Participating Line Office, Staff Office, and Council Responsibilities:

- 1) NWS is responsible for operational infrastructure to support hydrologic forecast generation and dissemination of hydrologic information, including forecasts, watches, and warnings at WFOs and RFCs.
- 2) Office of Oceanic and Atmospheric Research is responsible for research to improve understanding of hydrometeorological processes and collaboration with NWS to move scientific advances into operations.
- 3) National Ocean Service is responsible for coastal zone monitoring and modeling, and collaboration with NWS to move coastal data and modeling into operations.
- 4) National Environmental Satellite, Data, and Information Service is responsible for providing remotely sensed data and products such as precipitation, soil moisture, vegetation, radiation and temperature fluxes, snow cover, and evapotranspiration for use in hydrologic models.
- 5) The NOAA Marine and Aviation Operations component of NOAA's Fleet Services Sub-goal is responsible for providing aircraft platforms for observing systems during field experiments and routine collection of snow survey data.
- 6) The NOAA Office of General Counsel (GC) is responsible for providing legal services necessary to enable the program to discharge its duties. In this regard, NOAA GC provides a variety of specific services on an as-needed basis, including but not limited to: advice on legal issues related to program responsibilities; review and clearance of agreements, testimony, correspondence, and other documents; legal representation; assistance with litigation and requests for testimony or information; and coordination on behalf of the program with the Department of Commerce GC in the areas of contract, grant, intellectual property, labor and employment, appropriations, legislation and regulation, grant, litigation, and telecommunications law.
- 7) NOAA's Councils are responsible for providing policy guidance and frameworks to resolve issues in education and outreach, observations, modeling, information technology infrastructure and security, international activities, fleet allocation, and tool development.
- 8) Administrative Services is responsible for providing administrative support for grants.

- 9) Facilities Services is responsible for providing a safe and productive work environment.
- 10) General IT services include: email consolidation, enterprise level networking, and security of the enterprise.
- B. External Agency/Organization Responsibilities (e.g., EPA, Fish and Wildlife Service, state agencies, international partners, private sector organizations):
 - 1) U.S. Geological Survey is the primary source for measurements of river and stream, height and flow data for use in hydrologic models.
 - 2) U.S. Department of Agriculture, Natural Resources Conservation Service, collects snow data used for water supply forecasting.
 - 3) U.S. Bureau of Reclamation provides information on the quantity of water flowing through their reservoirs for use in hydrologic models.
 - 4) U.S. Army Corps of Engineers provides information on the quantity of water flowing through their reservoirs for use in hydrologic models.
6. END USERS OR BENEFICIARIES OF PROGRAM
 - A. Academia – the program awards extramural research grants to improve the scientific understanding of river, flood and water resources forecasting.
 - B. Water Management Agencies – the program provides water quantity and quality forecasts and warnings with information enabling cost effective water facility operations, e.g., reservoir management and hydropower scheduling.
 - C. River Commerce Transportation – the program provides river level forecast information enabling cost effective transport loading and scheduling.
 - D. Agriculture and Industry – the program provides information on future water availability and quality enabling water allocation and use decisions.
 - E. General Public – the program delivers river, flood and flash-flood forecasts enabling the public to make informed decisions; whether using the water for recreation or for staying out of harms way.
 - F. Local, State, and Federal Emergency Management Agencies and Organizations - the program delivers river, flood and flash-flood forecasts enabling the emergency managers at all levels of government to make informed decisions.